REMARKS/ARGUMENTS

This is in response to the official action dated December 5, 2006. Reconsideration is respectfully requested.

Claim Rejection under 35USC § 101

The Examiner stated that claims 1, 3, 5 and 7-12 remain rejected because the claimed invention is directed to non-statutory subject matter. The Examiner also rejected claims 1 and 7 as being anticipated by Courrieu.

It is noted that after the first office action, claims 8 and 9 were objected to but contained allowable subject matter. Applicants amended claim 8 and rewrote the claim in independent form. In the next office action, the Examiner stated (page 8, 4th paragraph) that new grounds for rejections resulted form Applicants amendment. Applicants do not understand this rejection and request clarification as to which part of the amendment caused the rejection, when the claim was merely made independent.

Applicants have now amended claims 1, 8, 11 and 12 to overcome the rejections under 101 and submit that the object of the invention is not the mathematical algorithm itself. It is stressed that the claims claim a method and system for checking whether an input data record is in a working range of a neural network. The input data record are manufacturing process data such as data relating to the materials used, composition data, parameters of the production system, pressure data and/or temperature data. The working range is defined by the convex envelope formed by training input data records of the neural network. The result is also claimed in that the input data record is inside or outside the working range of the used neural network through confirming that the input data is respectively inside or outside the convex envelope. Thus, the method and system for checking whether an input data record of manufacturing process data of materials used, composition data, parameter of the production system, pressure or temperature data are within the working range of a neutral network is statutory subject matter and not an algorithm or mathematical manipulation. Accordingly, because the claims claim tangible, useful and concrete subject matter, they are certainly a "real world result with practical application" and therefore, the claims are statutory and the rejection should be withdrawn.

Claim Rejection under 35USC § 102

Claims 1-7 remain rejected as being anticipated by Courrieu. The Examiner stated that Courrieu would teach a method as claimed in claim 1, 7 and 10 for checking whether an input data record is in working range of a neural network. In response, Applicants submit that Courrieu does teach a method for checking whether an input data record is in a working range of neural network, but the reference offers the following algorithmic solutions:

(1) The first algorithm uses the hyperrectangle as defined in p. 170, column 1, §2 as the product of the intervals between the min and max bounds of the values of the learning set input variables.

(2) The further algorithm also approximates the convex hull (envelope) polytope calculating the polytope's circumscribed sphere ignoring that for example the training data range in some dimensions may be narrow and the convex hull (envelope) therefore closer to an egg than to a sphere.

As both algorithms only **roughly approximate** the convex hull formed by the training input data records and **do not lead to an exact definition of this convex hull.** Courrieu's methods only give likeliness results on if the input data is within or outside this convex hull.

Applicants submit again, that the present invention relies on the **precise definition** of the working range as the convex envelope formed by the training input data records standing for the 100 %-reliable working range of a neural network. Depending on the reliability requirement for used neural networks within its application field, the direct vicinity of the convex may also be considered as permitted working range. If the reliability requirement is high as for example in a continuous production then only interior of the convex hull is defined as the working range of used neural network. The user has full control if and to what extent closed vicinity of the convex hull should also be considered as permitted working range as opposed to the state of the art wherein the convex hull formed by the training input data records is not precisely approximated.

Thus, the purpose of the present invention to provide a method for checking whether an input data record is within a working range of a neural network, wherein the working range is **precisely defined** as the convex envelope formed by the training input data records of the neural network, which can be precisely calculated using algorithms mentioned in claims 1, 11, 12 and

dependant claims thereof.

The algorithm of claim 1 uses a simplex method, wherein a simplex is the convex hull of a set of (d+1) non-collinear points from the set of training of the input record. For providing the definition of a simplex, Applicants' points to http://en.wikipedia.org/wiki/Simplex . The present method relies on iterative definition of simplexes, comprising defining a first simplex, selecting a point within said simplex, defining a path between the input data record and the selected point and check if there is an intersection between the path and a facet of the said simplex and then defining a second simplex containing the intersection point and a section of said path. This iterative method allows exact calculation of the convex hull formed by the training input data records in complex n-multidimensional working spaces. Thus, Courrieu et al. does not teach or suggest utilizing any simplex method.

Concerning the rejection of claim 7-9 (now 8-9), Applicants submits that a neural network includes interconnected processing elements such as nodes or neurons that work together to produce an output function (see for example http://en.wikipedia.org/wiki/ Neural networks). A neural network therefore a technical device and not software and therefore a patentable element as utilized the context provided in the claims.

Concerning novelty of claim 7 (claim 7 has been canceled in favor of claim 8), Courrieu describes on p. 173, § 5.1 a reliability test procedure for his method. A generator algorithm produces several neural networks on the basis of a learning set of 64 points, the error tolerance level of produced neural networks being set low. For each learning sets the convex hull polytope and the circumscribed sphere were computed. The relation between the exteriority to the computed convex hull polytope and circumscribed sphere and the absolute error were then tested. Courrieu does not describe or teach produced neural networks which are combined in a system for determining at least one predicted value. Further, the reference also does not describe or teach the advantages of combining neural networks. Thus, Claim 7 should therefore be patentable.

Accordingly, the independent claims 1, 7, 11 and 12 are patentable and the dependent claims are patentable for at least the reasons supporting the patentability of the independent claims.

Claim Rejection under 35USC § 103

Claim 10 was rejected as obvious over Courrieu in view of Wennmyr.

Claim 10 is incorporating currently amended independent claim 1, which has been amended to further define the invention, as discussed above in the context of the discussion of the Courrieu reference. Applicants pointed out that Courrieu only provides both second and third algorithms which only approximate the convex hull and which do not lead to an exact definition of the convex hull and thus, only give likeliness results regarding whether the input data is within or outside the real convex hull.

Applicants' previous arguments are still valid arguments in that Wennmyr does not cure this deficiency. Wennmyr describes a method for training a neural network based on an algorithm for the calculation of a convex hull applicable in two and three dimensions, whereby the method recalculates the convex hull when a new training data point is introduced. Wennmyr does not teach that this algorithm may be applicable for higher dimensional spaces. Thus, even it one would combine the two references, they would still not result into applicants invention as presently claimed. Accordingly, Wennmyr fails to teach or suggest the subject matter missing from the Courrieu reference.

Claim 10 is therefore patentable over Courrieu and Wennmyr taken either alone or in combination.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If entry and consideration of the amendments above requires an extension of time, Applicants respectfully request that this be considered a petition thereof. The Assistant Commissioner is authorized to charge any fee(s) due in this connection to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess, to Deposit Account No. 14-1263.

Respectfully submitted,
NORRIS McLAUGHLIN & MARCUS, P.A.

By Christa Hildebrand

Christa Hildebrand
Reg. No. 34,953
875 Third Avenue - 18th Floor
New York, New York 10022
Phone: (212) 808-0700
Fax: (212) 808-0844
Facsimile: (212)808-0844